Young Catholic's

ILLUSTRATED

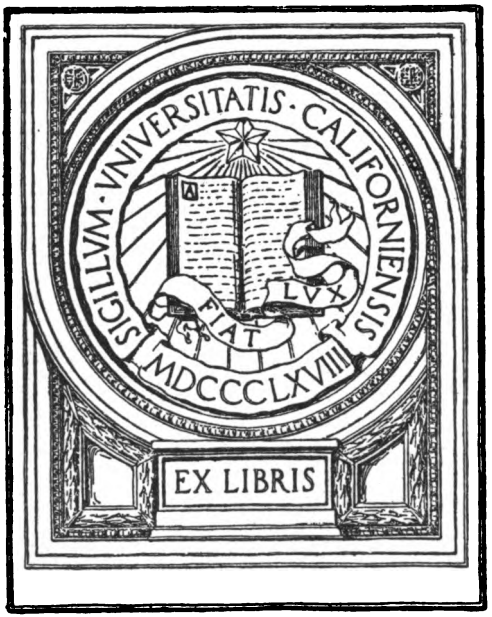
TABLE BOOK,

AND

First Lessons in Numbers.

New York:
CATHOLIC PUBLICATION SOCIETY,
No. 9 WARREN STREET.

IN MEMORIAM
FLORIAN CAJORI



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First Lessons in Numbers.

COUNTING.

LESSON I.

1. A single thing is called **a Unit, or One.**

2. **A Number** is one, or more than one.

3. **Figures are Marks** used to express numbers.

4. **Counting** is expressing numbers by words.

5. How many dogs has the girl in the picture? **One.**

6. How many eyes have you? **Two.**

7. Two cents are how many more than one cent?

8. If you had two cents and spent them, how many would you have left?

9. How many are two pictures and one picture? **Three.**

10. Three cents are how many more than two cents?

11. If you had three cents and spent them, how many would you have left?

12. How many are three pencils and one pencil? **Four.**

13. Count the fingers of your left hand: how many have you?

14. Four cents are how many more than three cents?

15. Count from one to four.

16. Count from four back to naught.

17. Hold up four fingers.

18. Copy and read the figures denoting **naught**, one, two, three, and four.

Printed form,	0	1	2	3	4
Name,	naught,	one,	two,	three,	four.
Slate form,	*0*	*1*	*2*	*3*	*4*

19. Which figure expresses the greatest number?

LESSON II.

1. Calling the thumb a finger, how many fingers have you on your right hand? **Five.**

2. Five cents are how many more than four cents?

3. Count from one to five.

4. Name five objects or things in the room.

5. How many are five boys and one boy? **Six.**

6. Six is how many more than five?

7. Count from one to six.

8. From six back to naught.

9. Draw six straight lines on the black-board.

10. Draw one more: how many are six lines and one line? **Seven.**

11. Name seven boys or girls.

12. Count from one to seven.

13. From seven back to naught.

14. Place seven pencils on the table: if you place one more with them, how many will there be? **Eight.**

15. How many are seven chickens and one chicken?

16. Eight is how many more than seven?

17. Eight is how many more than one?

18. Count from one to eight.

19. From eight back to naught.

20. How many are eight oranges and one orange? **Nine.**

21. What comes next before nine? Before eight?

22. Count from three to nine. From five to nine.

23. Copy and read the figures denoting five, six, seven, eight, and nine.

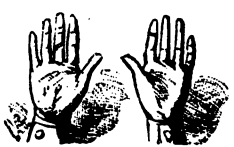
Printed form,	5	6	7	8	9
Name,	five,	six,	seven,	eight,	nine.
Slate form,	*5*	*6*	*7*	*8*	*9*

24. Which figure expresses the smallest number?

25. Which figure expresses the greatest number?

LESSON III.

1. How many fingers and thumbs have you on both hands? **Ten.**



2. Count from one to ten.

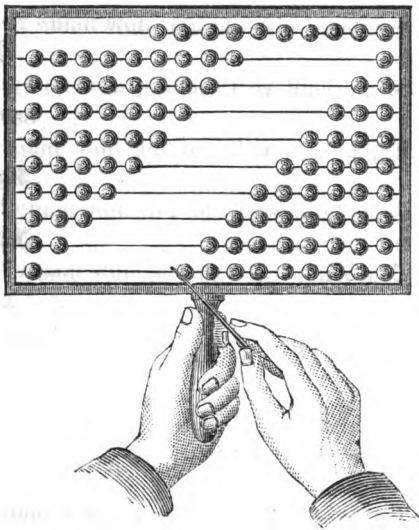
3. From ten back to one.

4. Ten is one more than what number?

5. Count by twos from two: as, two, four, etc.

6. Count by twos from one: as, one, three, etc.

7. Count the balls on the upper wire of the **Numeral Frame,** as they are moved from left to right.



8. How many will one ball on the next wire make counted with the ten on the upper wire ?

Eleven.

9. Two balls on the next wire counted with the ten on the upper wire will make how many ?

Twelve.

10. Three balls on the next wire counted with the ten, will make how many ? **Thirteen.**

11. Four balls on the next wire counted with the ten, will make how many ? **Fourteen.**

12. Five balls with the ten, how many ?
Fifteen.

13. Six balls with the ten, how many ?
Sixteen.

14. Seven balls with the ten, how many ?
Seventeen.

15. Eight balls with the ten, how many ?
Eighteen.

16. Nine balls with the ten, how many ?
Nineteen.

17. Ten balls with the ten, how many ?
Twenty.

LESSON IV.

1. Ten roses and one rose are how many ?
2. Eleven is how many more than ten ?
3. How do you express eleven ?
   Ans. By writing the figure 1 with a figure 1 on the right.
4. In expressing eleven, how many figures are used ?
5. Eleven peaches and one peach are how many ?
6. Count from one to twelve.

7. How do you express twelve?

Ans. By writing the figure 1 with a figure 2 on the right.

8. Count from twelve back to naught.

9. Count by threes to twelve.

10. Twelve is how many more than ten?

11. Show by the numeral frame that twelve is two more than ten.

12. Twelve pears and one pear are how many?

13. Thirteen is how many more than ten?

14. Show it by the numeral frame.

15. How do you express thirteen?

16. Thirteen oranges and one orange are how many?

17. Fourteen is how many more than ten?

18. Show it by the numeral frame.

19. How do you express fourteen?

20. Count from one to fourteen.

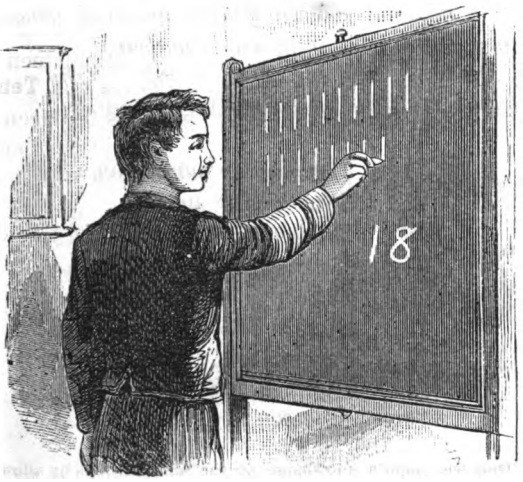
21. From fourteen back to one.

22. Copy and read the figures denoting ten, eleven, twelve, thirteen, and fourteen.

10	11	12	13	14
ten,	eleven,	twelve,	thirteen,	fourteen.
10	*11*	*12*	*13*	*14*

LESSON V.

1. What is the meaning of the word thirteen?
Three and **Ten.**
2. What is the meaning of the word fourteen?
Four and **Ten.**
3. Count by twos to fourteen.
4. Fourteen plums and one plum are how many?
5. Fifteen is how many more than ten?
6. Show it by the numeral frame.
7. How do you express fifteen?
8. Count from ten to fifteen.
9. How many cents are fifteen cents and one cent?
10. Sixteen is how many more than ten?
11. Show it by the numeral frame.
12. How do you express sixteen?
13. Count from ten to fifteen.
14. What is the meaning of the word sixteen?
15. What is the meaning of the word fifteen?
Five and **Ten.**
16. How many dollars are sixteen dollars and one dollar?
17. Seventeen is how many more than ten?
18. Show it by the numeral frame.
19. Count from ten to seventeen.
20. How do you express seventeen?
21. What is the meaning of the word seventeen?



LESSON VI.

1. How many men are seventeen men and one man ?

2. Show by marks on the black-board that ten and eight are eighteen.

3. How do you express eighteen ?

4. What number comes next after eighteen ?

5. Count from ten to nineteen.

6. How do you express nineteen ?

7. What is the meaning of the word nineteen?

8. What number comes next after nineteen ?

9. Twenty is how many more than ten ?

10. Copy and read the figures denoting fifteen, sixteen, seventeen, eighteen, nineteen.

15 *16* *17* *18* *19*

11. Copy and compare the following:

0	*10*	
1	*11*	Eleven is 10 more than 1.
2	*12*	Twelve is 10 and 2.
3	*13*	Thirteen is 10 more than 3.
4	*14*	Fourteen is 10 more than 4.
5	*15*	Fifteen is 10 more than 5.
6	*16*	Sixteen is 6 more than 10.
7	*17*	Seventeen is 7 more than 10.
8	*18*	Eighteen is 8 and 10.
9	*19*	Nineteen is 9 more than 10.

Test the pupil's knowledge of the above groups by allowing him to read them in order, down and up, and out of order.

LESSON VII.

1. What is the meaning of the word twenty?

Two Tens.

2. How do you express twenty?

3. In expressing twenty, how many figures are used?

4. What is the figure on the right called?

Naught.

5. What figure is in the second place? Two.

6. Draw ten marks on the black-board.

7. Draw ten more, and count how many there are in both rows.

8. If you draw one more, how many?

Twenty-one.

9. If you draw one more, how many?

Twenty-two.

10. Another, how many? (Continue to 29.)

Twenty-three.

11. Twenty-nine is how many more than twenty?

12. How do you express twenty-one, etc.?

13. Count from twenty to twenty-nine.

14. Copy and read the figures denoting twenty, twenty-one, etc.

20 *21* *22* *23*

twenty, twenty-one, twenty-two, twenty-three,

24 *25* *26* *27*

twenty-four, twenty-five, twenty-six, twenty-seven,

28 *29.*

twenty-eight, twenty-nine.

15. Copy and compare the following:

0	*10*	*20*
1	*11*	*21*
2	*12*	*22*
3	*13*	*23*
4	*14*	*24*
Etc.		
9	*19*	*29*

LESSON VIII.

1. What is the meaning of the word thirty?

Three Tens.

2. In expressing thirty how many figures are used?

3. What is the figure on the right called?

4. What figure is in the second place?

5. Count from thirty to thirty-nine.

6. Thirty is how many more than twenty?

7. How many more than twenty-nine?

8. Write the figures denoting thirty, thirty-one, thirty-two, etc.

9. How do you express thirty-two?

10. How do you express twenty-three?

11. Copy and compare the following:

0	*10*	*20*	*30*
1	*11*	*21*	*31*
2	*12*	*22*	*32*
Etc.			
9	*19*	*29*	*39*

12. What number comes next after thirty-nine?

Forty.

13. What is the meaning of the word forty?

Four Tens.

14. In expressing forty, what figure occupies the second place?

15. Count from forty to forty-nine.

16. Write the figures denoting forty, forty-one, forty-two, etc.

17. Copy and compare the following:

0	*10*	*20*	*30*	*40*
1	*11*	*21*	*31*	*41*
2	*12*	*22*	*32*	*42*
3	*13*	*23*	*33*	*43*
Etc.				
9	*19*	*29*	*39*	*49*

LESSON IX.

1. Count from one to one hundred.

2. Count by twos to one hundred.

3. In one hundred, what is the figure on the right called?

4. What figure is in the second place?

5. What figure is in the third place?

6. If a man had a hundred dollars and earned a hundred more, how many dollars would he have? **Two hundred.**

7. In expressing two hundred, how many figures are used?

8. What figure is in the first place? Second? Third?

9. Two hundred and one hundred are how many?

10. How is three hundred expressed?

By writing **three** in the third place, **naught** in the second place, and **naught** in the first place.

11. How is four hundred expressed?

12. Five hundred? 13. Six hundred?

14. Seven hundred? 15. Eight hundred?

16. Nine hundred?

Ans. By writing the figure 9 with two naughts on the right.

17. Count by hundreds from one hundred to nine hundred.

18. Copy and read:

100 200 300 400 500 600 700 800 900

19. Copy and compare the following:

0	*10*	*100*
2	*20*	*200*
3	*30*	*300*
Etc.		
9	*90*	*900*

LESSON X.

1. A man spent $100 for a horse and one dollar for a whip; how many dollars did he spend?

One hundred and **one** dollars.

2. How is one hundred and one expressed? By writing **one** in the third place, **naught** in the second place, and **one** in the first place.

3. Count from one hundred to one hundred and nine.

4. Copy and read the following:

100 101 102 103 104 105 106 107 108 109

5. What number comes next after 109?

One hundred and ten.

6. Count from 110 to 119.

7. Copy and read the figures denoting one hundred and ten, etc., to one hundred and nineteen.

8. Copy and compare:

100	*110*
101	*111*
102	*112*
Etc.	
109	*119*

9. What number comes next after 119?

10. Count from 120 to 129.

11. Copy and read:

120 121 122 123 124 125 126 127 128 129

12. Compare:

100	*110*	*120*
101	*111*	*121*
102	*112*	*122*
Etc.		
109	*119*	*129*

13. One hundred and nineteen is how many more than one hundred and nine?

14. One hundred and twenty-nine is how many more than one hundred and nine?

LESSON XI.

1. **Notation** is the art of **writing** numbers.

2. **Numbers** are written or expressed by **words, letters,** or **figures.**

3. The method of writing or expressing numbers by **letters** is called **the Roman Method.**

4. The method of writing or expressing numbers by **figures** is called **the Arabic Method.**

5. The **Roman Method of Notation** employs **seven capital letters** to express numbers.

6. The letter I, denotes **one**; V, **five**; X, **ten**; L, **fifty**; C, **one hundred**; D, **five hundred**; and M, **one thousand.**

7. Other numbers are expressed by repeating and combining these capitals.

8. Repeating a letter repeats its value; as, XXX, thirty.

9. If a letter **is placed before** one of greater value, the value of the less is taken from the greater; as, XL, forty.

10. If a letter **is placed after** one of greater value, the value of the less is added to the greater, as, LX, sixty.

11. The **Roman Method of Notation** is used in numbering the chapters, lessons, etc., into which books are divided, and in marking the hours on clocks and watches.

LESSON XII.

TABLE OF ROMAN NOTATION.

I	one.	XXV	twenty-five.
II	two.	XXVI	twenty-six.
III	three.	XXVII	twenty-seven.
IV	four.	XXVIII	twenty-eight.
V	five.	XXIX	twenty-nine.
VI	six.	XXX	thirty.
VII	seven.	XL	forty.
VIII	eight.	L	fifty.
IX	nine.	LIX	fifty-nine.
X	ten.	LX	sixty.
XI	eleven.	LXX	seventy.
XII	twelve.	LXXX	eighty.
XIII	thirteen.	XC	ninety.
XIV	fourteen.	C	one hundred.
XV	fifteen.	CC	two hundred.
XVI	sixteen.	CCC	three hundred.
XVII	seventeen.	CD	four hundred.
XVIII	eighteen.	D	five hundred.
XIX	nineteen.	DC	six hundred.
XX	twenty.	DCC	seven hundred.
XXI	twenty-one.	DCCC	eight hundred.
XXII	twenty-two.	CM	nine hundred.
XXIII	twenty-three.	M	one thousand.
XXIV	twenty-four.	MM	two thousand.

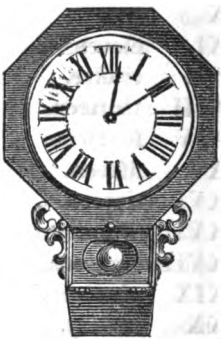
MDCCCLXXVI one thousand eight hundred and seventy-six.

LESSON XIII.

1. Express 35 by letters. XXXV.
2. In XXXV, how often is X repeated?
Three times.
3. Express 59 by letters. LIX.
4. From which letter is the value of I taken?
5. Copy and read the following numbers:

III.	XVI.	XLV.
VI.	XXIV.	LXIX.
VIII.	XXXVI.	CIV.

6. The face of a clock is divided into **twelve** equal parts, marked by the letters I, II, III, IV, V, VI, VII, VIII, etc.



7. The short hand points to the hours, and is called the **hour hand.**
8. The long hand points out the minutes, and is called the **minute hand.**
9. The hour hand moves from one number to the next in one hour.
10. If the hour hand is at XII, what time is it when the minute hand moves to I? **It is five minutes past twelve.**
11. When the minute hand moves to II?
Ten minutes past twelve.
12. When the minute hand moves to VI?
Half-past twelve.

LESSON XIV.

ARABIC NOTATION.

1. **The Arabic Method of Notation** employs **ten figures** to express numbers. These figures were brought into Europe from Arabia.

0 1 2 3 4 5 6 7 8 9

2. **The figures from 1 to 9 are called significant figures,** because each has a value of its own.

3. They are also called **digits,** because the ancients reckoned on their fingers (*digitus*, a finger).

4. The first is called **naught,** because when standing alone it has no value. It is also called **zero or cipher.** Nine is the greatest number expressed by a single figure.

5. The significant figures are called **units,** or figures of the **first order.** Numbers greater than ten form higher orders of units, called **tens, hundreds, thousands,** etc.

6. Ten is expressed by writing 1 in the second place, with a naught on the right: as, 10.

7. Figures standing in the second place are called **tens,** or units of the **second order.**

8. A hundred is expressed by writing 1 in the third place, with two naughts on the right.

9. Figures standing in the third place are called **hundreds,** or figures of the **third order.**

10. **Three figures** form **a period.**

11. In every period the right-hand figure represents **units,** the middle figure represents **tens,** and the left-hand figure represents **hundreds.**

12. What is the rule for expressing numbers of figures?

Begin at the left, and write the figures of the given orders in their places toward the right.

When intermediate orders are omitted, supply their place with naughts.

LESSON XV.

NUMERATION.

1. **Numeration** is the art of **reading** numbers.

2. In **the French Method of Numeration** three orders form a period.

3. Numbers are read by naming the figures, the places they occupy, and the period in which they stand.

4. What is the rule for reading numbers?

Divide them into periods of three figures each, beginning at the right.

Beginning at the left, read the periods in succession, calling each by its proper name.

NUMERATION TABLE.

3d Period.			2d Period.			1st Period.		
Hundreds of Millions.	Tens of Millions	Millions.	Hundreds of Thousands.	Tens of Thousands.	Thousands.	Hundreds.	Tens.	Units.
9	8	7,	6	5	4,	3	2	1.
Millions.			**Thousands.**			**Units.**		

This is read nine hundred and eighty-seven **million,** six hundred and fifty-four **thousand,** three hundred and twenty-one.

5. Recite the table. Copy and read:

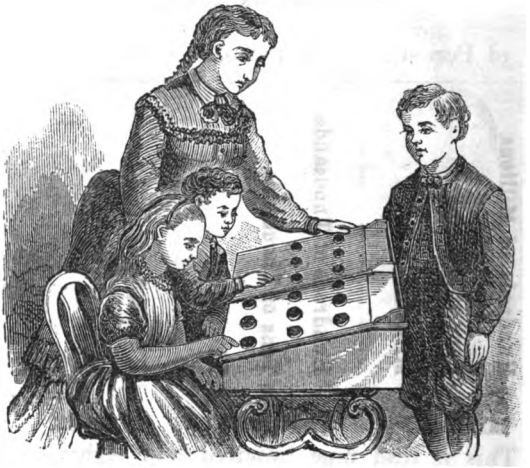
(6.)	(7.)	(8.)	(9.)	(10.)
117	*131*	*190*	*3176*	*1021*
234	*118*	*600*	*1041*	*9010*
607	*636*	*309*	*5360*	*3007*

11. Write in figures nine thousand and thirty-four.

12. Six thousand, one hundred and four.

13. Ninety thousand, seven hundred and twenty-nine.

14. One million, one thousand, one hundred and twenty-five.



AN EXERCISE WITH COUNTERS.

LESSON XVI.

ORDINAL NUMBERS.

The words **first, second, third,** etc., are called **Ordinal Numbers.** They denote **the order** in which objects are arranged.

Name the seven days of the week.

What day of the week is Sunday? Monday? Tuesday? Wednesday? etc.

Name the first month, second, etc.

What is the name of the first period, second, third, etc.

ADDITION.

LESSON I.

1. **Addition** is the process of uniting several numbers into one sum.

2. **The Sum, or Amount,** is the result or number obtained. It is equal to all the numbers added.

3. **The Sign of Addition** is a perpendicular cross +, and is called **plus,** which means **more.** Placed between two numbers, it shows that they are to be **added** together.

LESSON II.

Principles.—1. Only like Numbers can be added. 2. The sum and the numbers added must be like numbers.

0	and	1	are	1.	6	and	1	are	7.
1	"	1	"	2.	7	"	1	"	8.
2	"	1	"	3.	8	"	1	"	9.
3	"	1	"	4.	9	"	1	"	10.
4	"	1	"	5.	10	"	1	"	11.
5	"	1	"	6.	11	"	1	"	12.

1. George has 2 books on the seat and 1 book in his hand: how many has he in all?

Solution.—2 books and 1 book are 3 books.

2. How many are 4 horses and one horse?

3. If you have 5 pencils and your teacher gives you one more, how many will you have?

Solution.—I will have the sum of five pencils and one pencil, which is six pencils.

(4.)	(5.)	(6.)	(7.)	(8.)	(9.)	(10.)	(11.)
0	*1*	*2*	*3*	*4*	*5*	*6*	*7*
1	*1*	*1*	*1*	*1*	*1*	*1*	*1*
—	—	—	—	—	—	—	—

12. **The sign of equality** is two short parallel lines =. It is read **equals** or **equal**. Placed between two numbers, it denotes that they **equal** each other. It may be read 5+1 **are** 6.

13. **The dollar sign** is an **S** and two parallel lines drawn through it: thus, **$**.

LESSON III.

0	and	2	are	2.	6	and	2	are	8.
1	"	2	"	3.	7	"	2	"	9.
2	"	2	"	4.	8	"	2	"	10.
3	"	2	"	5.	9	"	2	"	11.
4	"	2	"	6.	10	"	2	"	12.
5	"	2	"	7.	11	"	2	"	13.

1. Three windows and one window are how many?

2. If John has 4 books, and buys 2 more, how many will he have?

3. How many are 5 slates and 2 slates?

4. How many are 7 desks and 2 desks?

5. Show that 8 pencils and 2 pencils are 10 pencils.

6. A boy had 9 cents, and earned two more: how many did he then have?

7. Mary has 11 cherries, and Kate has 2 cherries: how many cherries have both girls?

8. John had 2 apples, his sister had 5, and his brother had two: how many had all?

Copy and complete the following:

(9.)	(10.)	(11.)	(12.)	(13.)	(14.)	(15.)	(16.)
0	*1*	*2*	*3*	*4*	*5*	*6*	*7*
2	*2*	*2*	*2*	*2*	*2*	*2*	*2*
—	—	—	—	—	—	—	—

(17.) $2+1+2=?$ (18.) $3+1+2=?$ (19.) $5+1+2=?$

20. Count by twos till you reach 60.

LESSON IV.

0	**and**	3	**are**	3.		6	**and**	3	**are** 9.
1	"	3	"	4.		7	"	3	" 10.
2	"	3	"	5.		8	"	3	" 11.
3	"	3	"	6.		9	"	3	" 12.
4	"	3	"	7.		10	"	3	" 13.
5	"	3	"	8.		11	"	3	" 14.

1. Two coats and three coats are how many?

2. Show that 4 pencils and 3 pencils are 7 pencils.

3. There are 6 skates in one window and 3 skates in another: how many are in both windows?

4. There were 7 houses in one street, and they are building 3 new houses: how many will there be when these are finished?

5. A man had 9 cows, and bought three more: how many did he then have?

6. Count by threes, beginning with three: thus, 3, 6, 9, etc.

7. Count by threes, from one. From two.

8. Eleven cents and three cents are how many?

9. Write the table thus: $0+3=3$.

Copy and complete the following:

(10.)	(11.)	(12.)	(13.)	(14.)	(15.)	(16.)	(17.)
0	*1*	*2*	*3*	*4*	*5*	*6*	*7*
3	*3*	*3*	*3*	*3*	*3*	*3*	*3*
—	—	—	—	—	—	—	—

(18.) $4+2+3=?$ (19.) $8+2+3=?$ (20.) $9+1+3=?$

LESSON V.

0	and	4	are	4.		6	and	4	are	10.
1	"	4	"	5.		7	"	4	"	11.
2	"	4	"	6.		8	"	4	"	12.
3	"	4	"	7.		9	"	4	"	13.
4	"	4	"	8.		10	"	4	"	14.
5	"	4	"	9.		11	"	4	"	15.

1. One ship and four ships are how many?

2. Two masts and four masts are how many?

3. Five ropes and four ropes are how many?

4. Show that 3 books and 4 books are seven books.

5. Six houses and four houses are how many?

6. Seven men were in one boat and four in another: how many were in both?

7. The tail of a boy's kite was ten feet long; he tied on four feet: what was its whole length?

8. A man had 4 dollars, and he earned 9 dollars: how many did he then have?

Solution.—He had the sum of $4 and $9, which is 13 dollars; Or he had $13, because $4 and $9 are $13.

Copy and complete the following:

(9.)	(10.)	(11.)	(12.)	(13.)	(14.)	(15.)	(16.)
2	*3*	*4*	*5*	*6*	*7*	*8*	*9*
4	*4*	*4*	*4*	*4*	*4*	*4*	*4*
—	—	—	—	—	—	—	—

(17.) $2+4+1=?$ (18.) $4+4+1=?$ (19.) $2+1+4=?$

20. Count by fours till you reach 60.

LESSON VI.

0	and	5	are	5.		6	and	5	are 11.
1	"	5	"	6.		7	"	5	" 12.
2	"	5	"	7.		8	"	5	" 13.
3	"	5	"	8.		9	"	5	" 14.
4	"	5	"	9.		10	"	5	" 15.
5	"	5	"	10.		11	"	5	" 16.

1. Two boys and five boys are how many?

2. Show by lines on the black-board that three and five are eight.

3. One room has 5 windows, and another has 6: how many windows in both rooms?

4. There are 5 houses in one row and 7 in another: how many in both?

5. I counted 8 apples on one branch and 5 on the next: how many on both?

6. There are 5 peaches in one basket and 9 in another: how many in both?

7. James caught 10 fish, and his brother caught 5: how many did both catch?

8. Edward is 7 years old: how old will he be 5 years hence?

9. If you are 9 years old and your brother is 5 years older than you, how old is your brother?

(10.)	(11.)	(12.)	(13.)	(14.)	(15.)	(16.)	(17.)
0	*1*	*2*	*3*	*4*	*5*	*6*	*7*
1	*1*	*1*	*1*	*1*	*1*	*1*	*1*
5	*5*	*5*	*5*	*5*	*5*	*5*	*5*
—	—	—	—	—	—	—	—

LESSON VII.

0	and	6	are	6.	6	and	6	are	12.
1	"	6	"	7.	7	"	6	"	13.
2	"	6	"	8.	8	"	6	"	14.
3	"	6	"	9.	9	"	6	"	15.
4	"	6	"	10.	10	"	6	"	16.
5	"	6	"	11.	11	"	6	"	17.

1. If you have 3 peaches and buy 6 more, how many will you have?

2. How many are 6 cents and 7 cents.

3. There are 4 buds on one bush and 6 on another: how many on both?

4. Charles paid 6 cents for ink and 8 cents for paper: how many cents did he spend?

5. How many cents must a boy have to buy ten cents' worth of cake and 6 cents' worth of candy?

6. How many cents must I give a boy if I wish him to buy a spool of thread at 6 cents and a yard of muslin at 11 cents?

Copy and complete the following:

(7.)	(8.)	(9.)	(10.)	(11.)	(12.)	(13.)	(14.)
6	*7*	*8*	*9*	*6*	*6*	*6*	*6*
1	*1*	*1*	*1*	*0*	*1*	*2*	*3*
6	*6*	*6*	*6*	*2*	*2*	*2*	*2*
—	—	—	—	—	—	—	—

(15.) $4+1+5+1=?$ (16.) $8+1+5+1=?$

17. Count by fives till you reach 60. By 6's.

LESSON VIII.

0	and	7	are	7.	6	and	7	are	13.
1	"	7	"	8.	7	"	7	"	14.
2	"	7	"	9.	8	"	7	"	15.
3	"	7	"	10.	9	"	7	"	16.
4	"	7	"	11.	10	"	7	"	17.
5	"	7	"	12.	11	"	7	"	18.

1. How many are 3 cents and 7 cents ?

2. Count by sevens till you reach 70.

3. How many are $5 and $7 ?

4. Three sheep are in one field and seven in another: how many are in both ?

5. There are 6 trees in one row and 7 in another : how many are there in the two rows ?

6. James spent 7 cents for pencils and 8 for a slate: how much money did he spend ?

7. A boy had 9 cents left after spending 7 cents : how many cents did he have at first ?

8. There are 10 boys in one line and 7 in another ; how many in both ?

9. A boy missed 7 words and recited 11 : how many words was he asked to spell ?

10. A railroad train was made up of 7 passenger cars, and 10 freight cars : how many in all ?

(11.)	(12.)	(13.)	(14.)	(15.)	(16.)	(17.)	(18.)
0	1	2	3	4	5	6	7
7	7	7	7	7	7	7	7
—	—	—	—	—	—	—	—

LESSON IX.

0	and	8	are	8.	6	and	8	are	14.
1	"	8	"	9.	7	"	8	"	15.
2	"	8	"	10.	8	"	8	"	16.
3	"	8	"	11.	9	"	8	"	17.
4	"	8	"	12.	10	"	8	"	18.
5	"	8	"	13.	11	"	8	"	19.

1. How many are $1 and $8?

2. There are 2 birds on the fence and 8 on the tree: how many are there in all?

3. A sponge cost 3 cents and a rubber 8 cents: how many cents did both cost?

4. There are 8 windows in the front of a house and 4 in the rear: how many are there in all?

5. John gave away 5 peaches and has 8 left: how many had he at first?

6. Six years ago John was 8 years old: how old is he now?

7. How many are 7 yards and 8 yards?

8. After selling 8 turkeys, a farmer has 8 left: how many had he at first?

9. How many are 9 and 8? 10 and 8? 11 and 8? 12 and 8?

10. Count by eights till you reach 80.

(11.)	(12.)	(13.)	(14.)	(15.)	(16.)	(17.)	(18.)
0	*1*	*2*	*3*	*4*	*5*	*6*	*7*
8	*8*	*8*	*8*	*8*	*8*	*8*	*8*
—	—	—	—	—	—	—	—

(19.) $8+4+3+2=?$ (20.) $9+1+3+5+1=?$

LESSON X.

0	and	9	are	9.	6	and	9	are	15.
1	"	9	"	10.	7	"	9	"	16.
2	"	9	"	11.	8	"	9	"	17.
3	"	9	"	12.	9	"	9	"	18.
4	"	9	"	13.	10	"	9	"	19.
5	"	9	"	14.	11	"	9	"	20.

1. A boy was sent for one pound of tea and 9 pounds of sugar: how many pounds must he carry home?

2. There are 9 persons in one family and 8 in another: how many persons in the two families?

3. Henry's hat cost $2 and his coat $9: how many dollars did both cost?

4. Count by nines till you reach 90.

5. Mary is four years old, and Kate was nine years when Mary was born: how old is Kate?

6. After giving away 5 roses, Jane has 9 left: how many had she at first?

7. If a quart of apples cost 6 cents and a quart of pears cost 9 cents, what will both cost?

8. Count by tens till you reach 100.

9. Paid $8 for a table and $9 for six chairs: how many dollars did I spend?

10. Charles and Edward had 9 marbles each; Charles gave his to Edward: how many did Edward then have?

11. Ten persons sat on one side of a car and 9 on the other: how many persons were in the car?

LESSON XI.

To add single columns.

1. Find the amount of 8, 3, 1, 4, 9. *Slate work.*

ANALYSIS.—1. Write the numbers one under another, in a perpendicular column, and draw a line underneath.

2. Begin at the bottom and add the numbers to one another, thus: 9, 13, 14, 17, 25.

3. Write the amount underneath.

Hence the sum is 25.

8	
3	
1	
4	
9	
—	
	25 *Ans.*

NOTES.—1. In adding, name the results only. Avoid this style: 9 and 4 are 13, and 1 are 14.

2. Require the pupil to add without counting fingers or other objects.

3. Insist on neat figures and perpendicular columns.

(2.)	(3.)	(4.)	(5.)	(6.)	(7.)	(8.)	(9.)
8	8	8	8	8	3	4	5
2	2	2	2	2	4	5	6
6	7	8	9	9	5	6	7
1	2	8	4	5	6	7	8
—	—	—	—	—	—	—	—

(10.)	(11.)	(12.)	(13.)	(14.)	(15.)	(16.)	(17.)
5	6	7	8	9	7	8	9
4	4	4	4	4	8	9	7
6	6	6	6	6	9	7	8
7	9	7	9	8	7	8	9
9	8	9	6	5	8	9	8
2	3	4	5	6	9	8	7
—	—	—	—	—	—	—	—

LESSON XII.

(1.)	(2.)	(3.)	(4.)	(5.)	(6.)	(7.)	(8.)
6	6	6	6	6	6	6	6
5	8	7	9	4	6	6	7
6	6	6	6	6	7	6	7
8	7	8	6	8	7	7	6
6	6	6	7	9	8	7	8
7	5	9	9	8	8	8	8
5	8	8	7	7	8	8	6
6	4	9	8	9	9	9	9
7	8	9	6	8	9	9	9
7	8	9	8	9	9	9	9

(9.)	(10.)	(11.)	(12.)	(13.)	(14.)	(15.)	(16.)
3	7	9	7	4	1	14	9
6	14	12	1	9	9	8	3
8	9	7	14	7	8	13	16
11	3	1	9	13	15	9	4
4	1	4	4	8	6	7	8

(17.)	(18.)	(19.)	(20.)	(21.)	(22.)	(23.)	(24.)
8	5	8	5	6	8	7	9
7	9	5	6	5	9	8	6
9	16	7	17	7	25	9	18
15	8	6	9	13	9	6	5
9	7	9	8	9	7	18	9
4	6	13	7	8	6	9	8

LESSON XIII.

When the sum of each column is less than 10.

1. What is the amount of 521 and 126?

Analysis.—1. Write the numbers one under another, units under units, tens under tens, etc., and draw a line underneath.

2. Add the figures in the units' column, and write the sum, which is 7 units, under units' place.

3. Add the figures in the tens' column, and write the sum, which is 4 tens, under the tens' place.

Continue thus until all the columns are added.

Hence the sum is 647.

Slate work.

521
126
—
647 *Ans.*

(2.)	(3.)	(4.)	(5.)	(6.)	(7.)	(8.)
12	22	32	48	15	17	234
13	23	33	10	71	40	123
14	24	34	21	12	31	430
—	—	—	—	—	—	—

(9.)	(10.)	(11.)	(12.)	(13.)	(14.)	(15.)
105	341	301	142	364	132	307
561	113	65	320	202	43	172
323	202	513	516	423	704	520
—	—	—	—	—	—	—

(16.)	(17.)	(18.)	(19.)	(20.)	(21.)
$	Pounds.	Men.	Miles.	Acres.	Horses.
234	230	561	35	802	240
140	614	15	913	91	514
405	135	303	51	106	143
—	—	—	—	—	—

LESSON XIV.

When the sum of a column equals or exceeds 10.

1. What is the amount of $365, $944, and $422?

ANALYSIS.—1. Write the numbers one under another, units under units, tens under tens, etc., and draw a line underneath.

2. Add the figures in the units' column. The sum is 12 units, equal to 1 ten and 2 units. Write the 2 units under units' place, and add the 1 ten to the tens' column, because it is of the same order.

3. The sum of the tens is 13 tens, equal to 1 hundred and 3 tens. Write the 3 tens under tens' place, and add the 1 hundred to the hundreds' column, because it is of the same order.

4. The sum of the hundreds is 17, and this being the last column we set down the whole amount.

Hence the sum is 1732.

Slate work.

$365
944
423
$1732 *Ans.*

NOTE.—At first give examples in which **one** column amounts to ten, or more.

2. One school has 308 pupils, another 96, and another 435: how many have all?

3. A merchant gained $450 the first year, $573 the second year, and $695 the third year: what was the whole gain?

4. Find the sum of 590 tons, 817 tons, 904 tons, and 1325 tons.

5. Three men sold a steamboat; the first received $2125 as his share, the second $936, and the third $3688: what was the value of the steamboat?

6. Add 508, 7009, and 60,306.

7. A captain sold his vessel for $3425, which was $2050 less than cost: what did it cost?

8. A man gave his property to his wife, son, and daughter; to his daughter he gave $3475, to his son $5150, and to his wife as much as he gave to his children: what was the value of his property?

9. A grocer bought 4 hogsheads of molasses; the first contained 95 gallons, the second 6 gallons more than the first, the third 7 gallons more than the second, and the fourth 27 gallons more than the third: how many gallons did he purchase?

RULE FOR ADDITION.

1. *Write the numbers one under another, units under units, tens under tens, hundreds under hundreds, etc.*

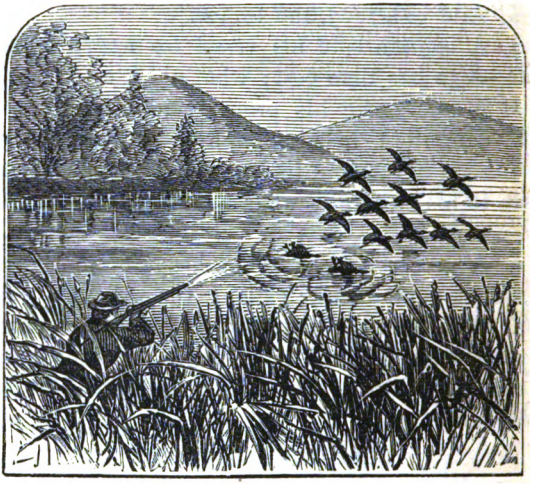
2. *Begin at the right-hand or units' column, and add each column separately.*

3. *When the sum of a column is less than ten, write it under the column added.*

4. *Where the sum of a column is* 10, *or more, write the units' figure under the column added, and add the remaining figure or figures to the next higher order.*

5. *When the last column is added, set down the whole amount.*

Proof.—Repetition is the only proof of addition.



SUBTRACTION.

LESSON I.

Subtraction is the process of finding the difference between two numbers.

The Difference, or remainder, is the number left after subtracting.

The Minuend is the number **from** which the subtraction is made.

The Subtrahend is the number to be subtracted.

The Sign of Subtraction is a short horizontal line —, called minus, which means **less.**

It shows that the number on the right is to be taken from the number on the left.

LESSON II.

Principle.—Only like Numbers can be subtracted.

1	from	1	leaves	0.	1	from	6	leaves	5.
1	"	2	"	1.	1	"	7	"	6.
1	"	3	"	2.	1	"	8	"	7.
1	"	4	"	3.	1	"	9	"	8.
1	"	5	"	4.	1	"	10	"	9.

1. Draw 3 chalk-lines on the black-board; erase one: how many are left?

2. Draw 4 lines; erase one: how many are left?

3. John had 5 cents and spent one cent for an apple: how many cents had he left?

Solution.—He had left the difference between 1 cent and 5 cents, which is four cents.

Copy and subtract the following:

(4.)	(5.)	(6.)	(7.)	(8.)	(9.)	(10.)	(11.)	(12.)
1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*
1	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
—	—	—	—	—	—	—	—	—

LESSON III.

2	**from**	2	**leaves**	0.	2	**from**	7	**leaves**	5.
2	"	3	"	1.	2	"	8	"	6.
2	"	4	"	2.	2	"	9	"	7.
2	"	5	"	3.	2	"	10	"	8.
2	"	6	"	4.	2	"	11	"	9.

1. Draw three lines on the black-board; erase two: how many are left?

2. Place four books in a row; take away two: how many are left?

3. Jane bought 5 apples and ate 2: how many had she left?

Solution.—2 apples from 5 apples leave 3 apples.

4. Joseph earned 7 cents; he spent two, and saved the rest: how many did he save?

5. If there are 9 roses in a bouquet, and Peter takes out two, how many will remain?

6. If you have 6 marbles and lose 2, how many have you left?

7. If there are 10 eggs in a nest, and a boy takes out two, how many are left?

8. A hunter saw 12 ducks on a pond; he shot two: how many escaped?

9. Write the table thus: 2—2=0.

10. What number is two less than 11?

(11.)	(12.)	(13.)	(14.)	(15.)	(16.)	(17.)	(18.)
2	3	4	5	6	7	8	9
2	2	2	2	2	2	2	2
—	—	—	—	—	—	—	—

LESSON IV.

3	**from**	3	**leaves** 0.	3	**from**	8	**leaves** 5.
3	"	4	" 1.	3	"	9	" 6.
3	"	5	" 2.	3	"	10	" 7.
3	"	6	" 3.	3	"	11	" 8.
3	"	7	" 4.	3	"	12	" 9.

1. Charles had 3 oranges and gave one to each of his three sisters: how many has he left?

2. John had 4 birds, and the cat killed 3 of them: how many were left?

3. If you have 5 rabbits, and give away three, how many will remain?

4. If you had 6 cents, and spent 3, how many cents will you have left?

5. A gentleman built 7 houses in a row; he sold 3: how many still belong to him?

6. 3 boys out of 9 were promoted: how many were not?

7. Louise bought 8 oranges and gave away 3: how many had she left?

8. A carpenter had 11 chisels, and broke 3: how many remained?

9. Willie had ten cents; he bought a top for two cents, and a cord for 1 cent: how much had he left?

(10.)	(11.)	(12.)	(13.)	(14.)	(15.)	(16.)
12	*13*	*14*	*15*	*16*	*17*	*18*
3	*3*	*3*	*3*	*3*	*3*	*3*
—	—	—	—	—	—	—

LESSON V.

4	**from**	4	**leaves**	0.	4	**from**	9	**leaves**	5.
4	"	5	"	1.	4	"	10	"	6.
4	"	6	"	2.	4	"	11	"	7.
4	"	7	"	3.	4	"	12	"	8.
4	"	8	"	4.	4	"	13	"	9.

1. If a boy had 4 cents, and bought 4 cents' worth of candy, how much money would he have left?

2. A boy bought 5 pencils and broke 4: how many has he left?

3. John promised to make 6 kites; he has 4 of them done: how many more must he make?

4. Edward picked 7 quarts of berries, and sold 4 quarts: how many had he left?

5. George caught 9 fish and his brother caught 4: how many did George catch more than his brother?

6. A hen had 10 chickens; four died: how many are still alive?

7. A farmer had 12 sheep; he sold 3 and 1 died: how many had he left?

8. A box of crackers weighed 13 pounds, and a box of candy 4 pounds: what is the difference in weight?

(9.)	(10.)	(11.)	(12.)	(13.)	(14.)	(15.)
14	*24*	*25*	*26*	*27*	*28*	*29*
4	*4*	*4*	*4*	*4*	*4*	*4*
—	—	—	—	—	—	—

LESSON VI.

5	**from**	5	**leaves**	0.	5	**from**	10	**leaves**	5.
5	"	6	"	1.	5	"	11	"	6.
5	"	7	"	2.	5	"	12	"	7.
5	"	8	"	3.	5	"	13	"	8.
5	"	9	"	4.	5	"	14	"	9.

1. Frederic had 6 rabbits, and sold 5; how many had he left?

2. If he has 1 left, how many must he buy so as to have 8 rabbits?

3. A pail filled with water weighed 9 pounds; without the water it weighed 4 pounds: how many pounds did the water weigh?

4. A merchant paid 11 cents a pound for sugar and sold it for 5 cents a pound: what was the loss on each pound?

5. A carpenter earned $12, and spent $5 for a saw: how many dollars had he left?

6. A grocer paid 5 cents a pound for cheese, and sold it for 13 cents: what was the gain?

7. John had $14, and he spent $5 for a hat: how many dollars had he left?

8. William is 14 years old, and his sister is 5 years younger: how old is his sister?

(9.)	(10.)	(11.)	(12.)	(13.)	(14.)	(15.)	(16.)
21	*22*	*23*	*24*	*25*	*26*	*27*	*28*
5	*5*	*5*	*5*	*5*	*5*	*5*	*5*
—	—	—	—	—	—	—	—

LESSON VII.

6	from	6	leaves	0.	6	from	11	leaves	5.
6	"	7	"	1.	6	"	12	"	6.
6	"	8	"	2.	6	"	13	"	7.
6	"	9	"	3.	6	"	14	"	8.
6	"	10	"	4.	6	"	15	"	9.

1. Jane carried 7 quarts of berries to market, and sold 6: how many quarts were left?

2. Charles rises at 6 o'clock, and studies till 8: how many hours does he devote to study?

3. If you pay 6 cents for an orange, and sell it for 9 cents, how much will you gain?

4. If a grocer pays $10 a barrel for flour, and sells it for $6, how much will he lose?

5. There were 11 chairs in a room, and Mary removed 6: how many were left?

6. If you had 12 cents, and spent 4 for cake and 2 for apples, how many cents will remain?

7. 6 and how many make 14? Why?

8. 13 is the minuend, and 6 is the subtrahend: what is the remainder?

9. A farmer owned 15 sheep, but a wolf killed six: how many were left?

10. 6 and how many will make 20?

(11.)	(12.)	(13.)	(14.)	(15.)	(16.)	(17.)	(18.)
21	*22*	*23*	*24*	*25*	*26*	*27*	*29*
6	*6*	*6*	*6*	*6*	*6*	*6*	*6*
—	—	—	—	—	—	—	—

LESSON VIII.

7	**from**	7	**leaves**	0.	7	**from**	12	**leaves**	5.
7	"	8	"	1.	7	"	13	"	6.
7	"	9	"	2.	7	"	14	"	7.
7	"	10	"	3.	7	"	15	"	8.
7	"	11	"	4.	7	"	16	"	9.

1. A traveller started in the 7 o'clock train and reached home at 9: how long was he in the cars?

2. Frank passes 10 barns on his way to school; 7 are old: how many are new?

3. There were 11 chickens in a brood, and the rats killed all but 7: how many were killed?

4. Tom is now twelve years old, and he has been to school 7 years: how old was he when he began to go to school?

5. If I earn 13 cents and spend 7, how many cents will I have left?

6. A dress cost $14 and a hat cost $6 less: what was the cost of the hat?

7. There were 15 children in the park, but 7 have gone home: how many remain?

8. Jane is 16 years old, and Louise is 7 years younger: how old is Louise?

9. What is the difference between 7 and 17?

(10.)	(11.)	(12.)	(13.)	(14.)	(15.)	(16.)
30	*32*	*34*	*35*	*36*	*38*	*39*
7	7	7	7	7	7	7
—	—	—	—	—	—	—

LESSON IX.

8	from	8	leaves	0.	8	from	13	leaves	5.
8	"	9	"	1.	8	"	14	"	6.
8	"	10	"	2.	8	"	15	"	7.
8	"	11	"	3.	8	"	16	"	8.
8	"	12	"	4.	8	"	17	"	9.

1. A farmer paid $8 dollars a barrel for flour and sold it for $9: how much did he gain?

2. What is the difference between $8 and $10?

3. 11 passengers were riding in a car; 8 got out: how many continued to ride?

4. What must a carpenter saw from a 12-foot board to make it 8 feet long?

5. Charles is 8 years old; how many years will pass before he will be 13?

6. Francis saw 14 ducks on a lake, and shot 5: how many escaped?

7. If William has $8 and can save $1 a day: how long must he work to have $15?

8. A sloop sailed 8 miles in an hour, and a steamer 16 miles: how far were they apart at the end of the first hour?

9. Two men paid $17 for a boat; one agreed to pay $8: what must the second man pay?

(10.)	(11.)	(12.)	(13.)	(14.)	(15.)	(16.)	(17.)
31	*32*	*33*	*34*	*35*	*36*	*37*	*39*
8	*8*	*8*	*8*	*8*	*8*	*8*	*8*
—	—	—	—	—	—	—	—

LESSON X.

9	from	9	leaves	0.	9	from	14	leaves	5.
9	"	10	"	1.	9	"	15	"	6.
9	"	11	"	2.	9	"	16	"	7.
9	"	12	"	3.	9	"	17	"	8.
9	"	13	"	4.	9	"	18	"	9.

1. Harry bought a knife for 10 cents and sold it for 9 cents: how many cents did he lose?

2. Charles borrowed 11 cents and paid back 9, how many does he still owe?

3. A farmer planted 12 pear-trees, and 9 of them bear fruit: how many do not?

4. A grocer paid 9 cents a pound for cheese and sold it for 13 cents: what did he gain on each pound?

5. School opens at 9 o'clock: how many hours till noon?

6. A scholar answered 9 questions out of 14: how many did he miss?

7. James saved 15 cents; he bought a copy-book for 8 cents, and a pen for 1 cent: how much had he left?

8. A boy had 16 marbles and won 4; then he lost 9: how many had he left?

(9.)	(10.)	(11.)	(12.)	(13.)	(14.)	(15.)	(16.)
9	*19*	*29*	*30*	*32*	*34*	*36*	*38*
9	*9*	*9*	*9*	*9*	*9*	*9*	*9*
—	—	—	—	—	—	—	—

LESSON XI.

To subtract when each figure in the subtrahend is less than the one above it.

1. Find the difference between 75 and 21.

Analysis.—1. Write the less number under the greater, units under units, tens under tens, etc., and draw a line underneath.

2. Subtract the units thus: 1 unit from 5 units leaves 4 units. Write the remainder under the units' place, because it is units.

3. Subtract the tens, and write the remainder under the tens' place, because it is tens.

Hence the remainder is 54.

Slate work.

75
21
—
54 *Ans.*

	(2.)	(3.)	(4.)	(5.)	(6.)
From	59	74	295	359	842
Take	27	31	134	214	521

	(7.)	(8.)	(9.)	(10.)
From	176 pounds.	346 sheep.	569 horses.	$278
Take	162 "	313 "	266 "	138

	(11.)	(12.)	(13.)	(14.)
From	694 men.	359 miles.	189 tons.	$394
Take	684 "	45 "	72 "	103

	(15.)	(16.)	(17.)	(18.)
From	468 barrels.	963 trees.	277 feet.	$543
Take	57 "	32 "	64 "	241

LESSON XII.

When a figure in the subtrahend is greater than the one above it.

1. What is the difference between 575 and 327?

ANALYSIS.—1. Write the less number under the greater, units under units, tens under tens, etc., and draw a line underneath.

Slate work.

5 7 5
3 2 7
2 4 8 *Ans.*

2. Seven units from 5 units cannot be taken; we must take one ten from the ten's figure and add it to the 5 units, which makes 15 units. 7 units from 15 units leave 8 units, which we write under units' place, because it is units.

3. Since we took 1 ten from the 7 tens, there are 6 tens left; and 2 tens from 6 tens leave 4 tens, which we write under tens' place, because it is tens.

4. Three hundreds from 5 hundreds leave 2 hundreds.

Hence the remainder is 248.

NOTE.—1. Take one from the next figure: do not borrow and pay back.

2. It is necessary at first to mark this change in the slate work. In review, however, insist on a dot being placed over the figure from which 1 is taken (5̇7̇5).

2. I sold a watch for $110 which cost $75: what was the gain?

3. If I pay 35 cents for a brush, how much change will I receive out of a $2 bill?

4. A farmer sold a horse for $75, and bought a cow for $35 and a calf for $15: how many dollars had he left?

5. A gentleman placed $1250 in bank; he drew

out at one time $360, and at another $237: what sum remains in bank?

6. I purchased a house for $18572, and sold it for $20000: what did I gain?

ANALYSIS.—1. Two units from 0 unit cannot be taken. We must take one from the next significant figure.

2. 1 ten thousand from 2 ten thousands added to the thousands makes 10 thousands, leaving 1 ten thousand. 1 thousand from 10 thousand added to the hundreds makes 10 hundreds, leaving 9 thousands. 1 hundred from 10 hundreds added to the tens makes 10 tens, leaving 9 hundreds. 1 ten from 10 tens added to the units makes 10 units, leaving 9 tens.

3. 2 units from 10 units leave 8 units. 7 tens from 9 tens leave 2 tens. 5 hundreds from 9 hundreds leave 4 hundreds, etc. Hence the gain is $1428.

Slate work.

	9 9 9 10
	$2 0 0 0 0
	1 8 5 7 2
	1 4 2 8 *Ans.*

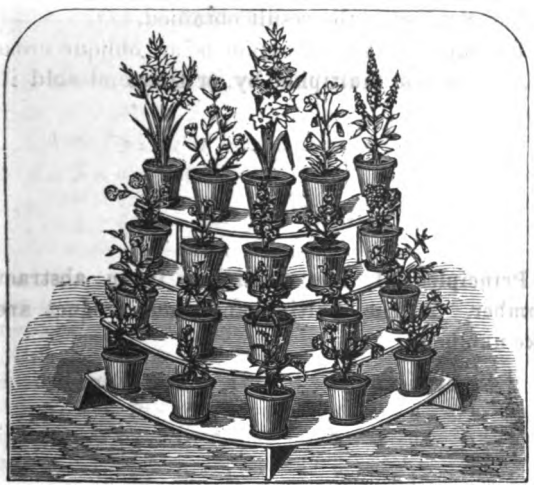
RULE FOR SUBTRACTION.

1. *Write the less number under the greater, units under units, tens under tens, etc.*

2. *Begin at the right or units' place, and subtract each figure of the lower number from the one above it, setting the remainder under the column subtracted.*

3. *If the lower figure is greater than the upper figure, increase the latter by ten, and consider the next higher figure one less; then subtract.*

Proof.—The sum of the remainder and subtrahend should equal the minuend.



MULTIPLICATION.

LESSON I.

Multiplication is the process of taking one of two numbers as many times as there are units in the other.

The Multiplicand is the number to be multiplied.

The Multiplier is the number which shows **how many times** the multiplicand is to be taken.

The Product is the result obtained.

The Sign of multiplication is an oblique cross ×. It is read **multiplied by, or times.**

LESSON II.

Principles.—1. The multiplier is an abstract number. 2. The multiplicand and product are like numbers.

2	**times**	1	**are**	2.	2	**times**	7	**are**	14.
2	"	2	"	4.	2	"	8	"	16.
2	"	3	"	6.	2	"	9	"	18.
2	"	4	"	8.	2	"	10	"	20.
2	"	5	"	10.	2	"	11	"	22.
2	"	6	"	12.	2	"	12	"	24.

1. Draw a line on the black-board each time that I give the signal. When two lines were drawn, **how many times** was the signal given?

2. Two times one line are how many?

3. What is the cost of 2 apples at 5 cents each?

Solution.—Since 1 apple cost 5 cents, 2 apples will cost 2 times 5 cents, which are ten cents.

4. If you can hold 8 chestnuts in one hand, how many can you hold in both?

5. Each boy has ten fingers: how many fingers have two boys?

LESSON III.

3	times	1	are 3.	3	times	7	are 21.
3	"	2	" 6.	3	"	8	" 24.
3	"	3	" 9.	3	"	9	" 27.
3	"	4	" 12.	3	"	10	" 30.
3	"	5	" 15.	3	"	11	" 33.
3	"	6	" 18.	3	"	12	" 36.

1. One ox has 2 horns: how many horns have 3 oxen?

2. In each of 3 boats there are 3 men: how many are there in all?

3. How many feet are in 4 yards?

4. A truckman can carry 6 barrels at a load: how many barrels can he take in 3 loads?

5. Mary is 7 years old, and her brother is 3 times as old: what is the age of her brother?

6. When pine-apples are 8 cents each, what will 3 pine-apples cost?

7. At $10 each what will be the price of 3 stoves?

8. What will 3 yards of muslin cost at 11 cents per yard?

9. If a copy-book contains 12 leaves, how many leaves will 3 copy-books contain?

Write the table, thus:

(A)	(B)
$3\times1=3.$	$1\times3=3.$
$3\times2=6.$	$2\times3=6.$
$3\times3=9.$	$3\times3=9.$

LESSON IV.

4	times	1	are	4.	4	times	7	are 28.
4	"	2	"	8.	4	"	8	" 32.
4	"	3	"	12.	4	"	9	" 36.
4	"	4	"	16.	4	"	10	" 40.
4	"	5	"	20.	4	"	11	" 44.
4	"	6	"	24.	4	"	12	" 48.

1. What will 4 yards of silk cost at $7 a yard ?

2. If a boy works 5 hours each day, how many hours does he work in 4 days ?

3. How many feet have 3 dogs ?

4. There are 4 gills in one pint: how many gills in 6 pints ?

5. If one table cost $7, what will 4 tables cost ?

6. If one pound of sugar cost 8 cents, how many cents will 4 pounds cost ?

7. I have 4 boards, each 9 feet long: what is the united length of the boards ?

8. Bought 4 pounds of sugar at 10 cents a pound, and sold it at 12 cents a pound ; what did I gain ?

9. At the rate of 7 for a cent, how many marbles can be bought for 4 cents ?

10. In form **A**, which is the multiplier ?

11. In form **B**, which is the multiplier ?

12. Write the table in both forms.

	(13.)	(14.)	(15.)	(16.)	(17.)	(18.)	(19.)
Multiply	*5*	*9*	*11*	*8*	*12*	*21*	*22*
By	*2*	*2*	*3*	*3*	*4*	*4*	*4*

LESSON V.

5	times	1	are 5.	5	times	7	are 35.
5	"	2	" 10.	5	"	8	" 40.
5	"	3	" 15.	5	"	9	" 45.
5	"	4	" 20.	5	"	10	" 50.
5	"	5	" 25.	5	"	11	" 55.
5	"	6	" 30.	5	"	12	" 60.

1. What will be the cost of 5 hats at $2 each?

2. At 3 cents each, what will be the cost of three oranges?

3. Frank lives 2 miles from school: how many miles does he walk in 5 days? *Ans.* 20 miles.

4. If a man earns $4 a day, how many dollars will he earn in 5 days?

5. If 6 marbles can be bought for one cent, how many can be bought for 5 cents?

6. There are 7 days in 1 week: how many days are there in 5 weeks?

7. Ten cents make one dime: how many cents in 5 dimes?

8. What will 11 quarts of chestnuts cost at 5 cents a quart?

9. How many inches in 5 feet? In 4 feet?

10. How many fives make 20? etc.

11. Write the table in both forms.

	(12.)	(13.)	(14.)	(15.)	(16.)	(17.)
Multiply	*11*	*12*	*21*	*27*	*31*	*111*
By	*5*	*5*	*5*	*5*	*5*	*5*

LESSON VI.

6	times	1	are 6.	6	times	7	are 42.
6	"	2	" 12.	6	"	8	" 48.
6	"	3	" 18.	6	"	9	" 54.
6	"	4	" 24.	6	"	10	" 60.
6	"	5	" 30.	6	"	11	" 66.
6	"	6	" 36.	6	"	12	" 72.

1. A workman earned $2 a day: how many dollars did he earn in 6 days?

2. Sarah saved $3 each month: how many dollars had she at the end of 6 months?

3. A grocer paid $5 a barrel for flour, and sold it for $9: what did he gain on 6 barrels?

4. A carpenter built 6 fences, each fence having 5 posts: how many posts did he use?

5. He built 6 houses, each house having 6 windows: how many window-frames were required?

6. If one sheet of paper makes 8 leaves of a copy-book, how many leaves will 6 sheets make?

7. A gentleman hired 5 workmen at $2 a day: how much must he pay them for 6 days' work?

8. A farmer carried 6 dozen of eggs to market, and sold them for 1 cent apiece: what did he get for them?

	(9.)	(10.)	(11.)	(12.)	(13.)	(14.)
Multiply	*9*	*11*	*21*	*111*	*201*	*311*
By	*6*	*6*	*6*	*6*	*6*	*6*

LESSON VII.

7	**times**	1	**are**	7.	7	**times**	7	**are** 49.
7	"	2	"	14.	7	"	8	" 56.
7	"	3	"	21.	7	"	9	" 63.
7	"	4	"	28.	7	"	10	" 70.
7	"	5	"	35.	7	"	11	" 77.
7	"	6	"	42.	7	"	12	" 84.

1. A jeweller paid $3 apiece for rings, and sold them for $4: what did he gain on 7 rings?

2. Each room in a hotel is lighted by 2 gas-jets: how many jets are in 7 rooms?

3. How many horseshoes will a blacksmith use in shoeing 7 horses?

4. If a barrel will hold 3 bushels of apples, how many bushels will 7 barrels hold?

5. What will 7 pairs of boots cost at $5 a pair?

6. How many feet in 7 boards each 6 feet long?

7. How many days are there in 7 weeks?

8. Alice is 8 years old, and her father is 7 times as old as she is: what is her father's age?

9. 7 tens are how many units?

10. If a family use 11 pounds of sugar in one week, how many pounds will they use in 7 weeks?

11. What will be the price of a dozen spools of cotton at 7 cents a spool?

	(12.)	(13.)	(14.)	(15.)	(16.)	(17.)
Multiply	*11*	*9*	*101*	*201*	*211*	*311*
By	7	7	7	7	7	7

LESSON VIII.

8	times	1	are 8.	8	times	7	are 56.
8	"	2	" 16.	8	"	8	" 64.
8	"	3	" 24.	8	"	9	" 72.
8	"	4	" 32.	8	"	10	" 80.
8	"	5	" 40.	8	"	11	" 88.
8	"	6	" 48.	8	"	12	" 96.

1. 8 quarts make a peck: how many quarts in 8 pecks?

2. What will be the cost of 8 yards of muslin, at 4 cents a yard?

3. Five boards, each 8 feet long, reach from the door of a cottage to the gate: what is the length of the yard?

4. An agent rented a house at $7 a month: how much did he receive in 8 months?

5. A carpenter made 8 ladders, each having 12 rungs: how many rungs did he use?

6. What will a boy receive for 8 quarts of berries at 9 cents a quart?

7. At 10 cents each what will 8 oranges cost?

8. 8 times 11 miles are how many miles?

9. What will a dozen copy-books cost at 8 cents each?

(10.)	(11.)	(12.)	(13.)	(14.)	(15.)
9	*11*	*7*	*101*	*111*	*210*
8	*8*	*8*	*8*	*8*	*8*
—	—	—	—	—	—

LESSON IX.

9	**times**	1	**are**	9.	9	**times**	7	**are**	63.
9	"	2	"	18.	9	"	8	"	72.
9	"	3	"	27.	9	"	9	"	81.
9	"	4	"	36.	9	"	10	"	90.
9	"	5	"	45.	9	"	11	"	99.
9	"	6	"	54.	9	"	12	"	108.

1. Sold 9 barrels of flour at a profit of $2 a barrel: what did I gain?

2. A carriage-maker finished 9 carriages: how many wheels did he use?

3. How many shelves can be made out of 9 boards, if one board will make three shelves?

4. What is the cost of 9 tables at $5 each?

5. Paid 5 cents each for pears, and sold them at a gain of 1 cent: what were 9 pears sold for?

6. What will 9 yards of velvet cost at $7 a yd.?

7. Each of 9 boys answered 8 questions; how many questions were answered?

8. 9 times naught are how many?

9. Bought 9 yards of muslin at 11 cents a yard: how much change did I receive out of a dollar?

10. What will 9 calves cost at $12 each?

11. Write the table in both forms.

(12.)	(13.)	(14.)	(15.)	(16.)	(17.)
7	*9*	*11*	*1001*	*1010*	*2001*
9	*9*	*9*	*9*	*9*	*9*
—	—	—	—	—	—

LESSON X.

10	times	1	are	10.	10	times	7	are	70.
10	"	2	"	20.	10	"	8	"	80.
10	"	3	"	30.	10	"	9	"	90.
10	"	4	"	40.	10	"	10	"	100.
10	"	5	"	50.	10	"	11	"	110.
10	"	6	"	60.	10	"	12	"	120.

LESSON XI.

11	times	1	are	11.	11	times	7	are	77.
11	"	2	"	22.	11	"	8	"	88.
11	"	3	"	33.	11	"	9	"	90.
11	"	4	"	44.	11	"	10	"	110.
11	"	5	"	55.	11	"	11	"	121.
11	"	6	"	66.	11	"	12	"	132.

LESSON XII.

12	times	1	are	12.	12	times	7	are	84.
12	"	2	"	24.	12	"	8	"	96.
12	"	3	"	36.	12	"	9	"	108.
12	"	4	"	48.	12	"	10	"	120.
12	"	5	"	60.	12	"	11	"	132.
12	"	6	"	72.	12	"	12	"	144.

LESSON XIII.

To multiply by one figure when the partial products are less than 10.

1. What will 3 houses cost at $1213 each?

Analysis.—1. Write the multiplier under the right-hand figure of the multiplicand. 2. Multiply the units figure of the multiplicand by the multiplier. 3 times 3 units are 9 units; which we write under units' place, because it is units. 3. 3 times 1 ten are 3 tens; which we write under tens' place, because it is tens. Continue thus until each figure of the multiplicand has been multiplied. Hence the product is $3639.

Slate work.

$1213
3
$3639 *Ans.*

Note.—Show that multiplication is a short method of adding equal numbers.

When a partial product is 10, or more.

What will 5 carriages cost at $417 each?

Analysis.—1. Write the multiplier under the right-hand figure of the multiplicand. Begin at units' place to multiply. 2. 5 times the 7 units are 35 units, equal to 3 tens and 5 units. Write the 5 units under the figure multiplied, and add the 3 tens to the product of the tens. 3. 5 times 1 ten are five tens, and 3 tens make 8 tens. Write the 8 under the figure multiplied. 4. 5 times 4 hundreds are 20 hundreds: this being the last figure to be multiplied, we set down the whole amount.

Slate work.

$417
5
$2085 *Ans.*

Note.—Teach multiplication by 10, 11, and 12 by one operation.

LESSON XIV.

When the multiplier is more than 12.

What will 24 pianos cost at $638 each?

ANALYSIS.—1. Write the multiplier under the multiplicand, units under units, tens under tens, etc.

2. 4 times 8 units are 32 units, or 3 tens and 2 units. Write the 2 units under the figure multiplied, and add the 3 tens to the product of the tens.

3. 4 times 3 tens are 12 tens, and 3 tens are 15 tens, or 1 hundred and 5 tens. Write the tens in tens' place, and add the hundreds to the product of the hundreds.

4. Continue thus until each figure of the multiplicand has been multiplied by the units figure of the multiplier.

5. 2 tens times 8 units are 16 tens, or 1 hundred and 6 tens. Write the tens under the figure multiplied by, and add the 1 hundred to the next product.

6. 2 tens times 3 tens are 6 hundreds, and 1 hundred are 7 hundreds. Write the 7 in hundreds' place, etc.

7. Add the partial products.

Slate work.

$638
24
2552
1276
$15312 *Ans.*

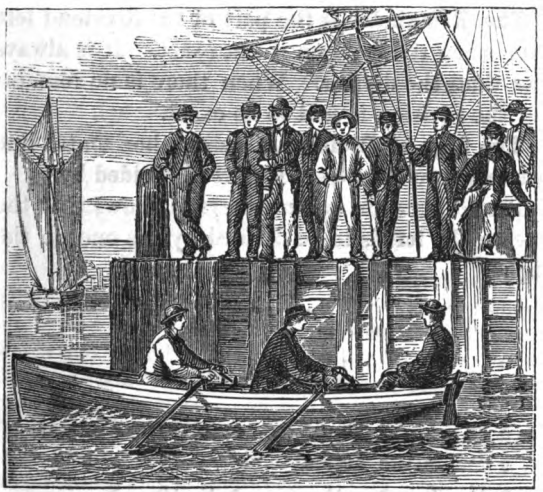
RULE FOR MULTIPLICATION.

1. *Write the multiplier under the multiplicand, units under units, etc.*

2. *Multiply the multiplicand by each figure of the multiplier, and set the first figure of each partial product under the figure multiplied by.*

3. *Add the partial products.*

Proof.—Repetition is the only proof of multiplication until division has been taught.



DIVISION.

LESSON I.

Division is the process of finding **how many times** one number is contained in another.

Or, Division is the process of finding one of the equal parts of a number.

The Dividend is the number to be divided.

The Divisor is the number to divide by.

The Quotient shows **how many times** the divisor is contained in the dividend.

The Remainder is the part of the dividend left over when the division is not exact. It is always less than the divisor. When there is no remainder the division is said to be exact.

The Sign of Division is a short horizontal line between two dots ÷. It is read **divided by.**

Placed between two numbers, it shows that the one on the **left** is to be divided by the one on the **right.**

LESSON II.

2 **in**	2,	1 **time.**		2 **in**	12,	6 **times.**	
2 "	4,	2 **times.**		2 "	14,	7 "	
2 "	6,	3 "		2 "	16,	8 "	
2 "	8,	4 "		2 "	18,	9 "	
2 "	10,	5 "		2 "	20,	10 "	

1. How many times 2 horses are 12 horses?

2. How many apples at 2 cents each can you buy for 4 cents?

Solution.—You can buy as many apples for 4 cents as 2 cents, the price of one apple, is contained times in 4 cents, which is 2 times; therefore, 2 apples can be bought.

3. How many peaches at 2 cents each can you buy for 6 cents?

4. How many $2 bills make twenty dollars?

5. If 2 dresses cost $18, what will 1 dress cost?

LESSON III.

3	in	3,	1 time.	3	in	18,	6 times.
3	"	6,	2 times.	3	"	21,	7 "
3	"	9,	3 "	3	"	24,	8 "
3	"	12,	4 "	3	"	27,	9 "
3	"	15,	5 "	3	"	30,	10 "

1. How many kites at 3 cents each can you buy for 6 cents?

2. 3 feet make a yard: how many yards are there in 9 feet?

3. If one boat holds 3 boys, how many boats will be required for 12 boys?

4. If you can buy a ring for 3 cents, how many can you buy for 15 cents?

5. A kite-frame requires 3 sticks: how many kites can be made with 18 sticks?

6. A plate holds 3 apples: how many plates will be required for 21 apples?

7. How many bags will be required to hold 24 bushels of potatoes, if one bag holds 3 bushels?

8. How many times 3 cents are 27 cents?

9. 30 is how many times 3?

10. How many threes in 15?

11. 3 is contained in 21 how many times?

12. Continue: $3 \div 3 = 1$. $6 \div 3 = 2$. $9 \div 3 = 3$.

(13.)	(14.)	(15.)	(16.)	(17.)	(18.)
$3)\underline{6}$	$3)\underline{12}$	$3)\underline{15}$	$3)\underline{18}$	$3)\underline{24}$	$3)\underline{30}$

LESSON IV.

4	in	4,	1 time.	4	in	24,	6 times.
4	"	8,	2 times.	4	"	28,	7 "
4	"	12,	3 "	4	"	32,	8 "
4	"	16,	4 "	4	"	36,	9 "
4	"	20,	5 "	4	"	40,	10 "

1. If 4 hats cost $8, what will one hat cost?

Solution.—If 4 hats cost $8, one hat will cost one-fourth of $8, which is 2 dollars.

2. If 4 yards of silk cost 12 dollars, what will one yard cost?

3. If 4 copy-books cost 16 cents, what will one copy-book cost?

4. If 4 panes of glass cost 20 cents, what will one pane cost?

5. If 4 wheels are needed for one carriage, how many carriages will 24 wheels supply?

6. If one bench will seat 4 boys, how many benches will seat 28 boys?

7. How many dresses will 32 yards of ribbon trim, if it takes 4 yards to trim one dress?

8. If 4 boys earn 40 cents, what will be each boy's share?

9. Continue: $4 \div 4 = 1$. $8 \div 4 = 2$. $12 \div 4 = 3$.

(10.)	(11.)	(12.)	(13.)	(14.)	(15.)
$4)\underline{8}$	$4)\underline{12}$	$4)\underline{20}$	$4)\underline{32}$	$4)\underline{40}$	$4)\underline{44}$

LESSON V.

5	in	5,	1 time.	5	in	30,	6 times.
5	"	10,	2 times.	5	"	35,	7 "
5	"	15,	3 "	5	"	40,	8 "
5	"	20,	4 "	5	"	45,	9 "
5	"	25,	5 "	5	"	50,	10 "

1. How many fans at 5 cents each can you buy for 5 cents?

2. How many spools of thread at 5 cents each can be bought for 10 cents?

3. How many times can 5 cents be taken from 15 cents?

4. If the railroad fare is 5 cents a mile, how far can you ride for 20 cents?

5. If you pay $5 apiece for sheep, how many sheep can you buy for $25?

6. An orchard contains 30 trees, and has 5 trees in each row: how many rows in the orchard?

7. How many fives in 35?

8. How many bouquets, each containing 5 roses, can you make with 35 roses?

9. A lady bought 5 cups for 40 cents: what did one cup cost?

10. If 5 tables cost $45, what will one table cost?

(11.)	(12.)	(13.)	(14.)	(15.)	(16.)
5)15	5)25	5)30	5)35	5)45	5)50

LESSON VI.

6	in	6,	1 time.	6	in	36,	6 times.
6	"	12,	2 times.	6	"	42,	7 "
6	"	18,	3 "	6	"	48,	8 "
6	"	24,	4 "	6	"	54,	9 "
6	"	30,	5 "	6	"	60,	10 "

1. How many pineapples at 6 cents each can be bought for 12 cents?

2. I paid 18 cents for 6 kites: what was the cost of each?

3. If 6 pounds of flour cost 24 cents, what is the cost of one pound?

4. How many days will 30 apples last, if you eat 6 each day?

5. How many boards 6 feet long will reach across a yard which is 36 feet in length?

6. If a stage holds 6 persons, how many stages will be required to carry 42 persons?

7. If 48 trees are planted in 6 equal rows, how many trees will there be in each row?

8. If James saves 6 cents a week, how long will it take him to save 54 cents?

9. If 6 trunks cost $60, what is the price of one?

10. Continue: $6 \div 6 = 1$. $12 \div 6 = 2$. $18 \div 6 = 3$.

(11.)	(12.)	(13.)	(14.)	(15.)	(16.)
$6)\underline{12}$	$6)\underline{24}$	$6)\underline{30}$	$6)\underline{42}$	$6)\underline{54}$	$6)\underline{60}$

LESSON VII.

7	in 7,	1 time.	7	in 42,	6 times.
7	" 14,	2 times.	7	" 49,	7 "
7	" 21,	3 "	7	" 56,	8 "
7	" 28,	4 "	7	" 63,	9 "
7	" 35,	5 "	7	" 70,	10 "

1. If 1 pound of sugar costs 7 cents, how many pounds can be bought for 14 cents?

2. 7 days make a week: how many weeks in 21 days?

3. I tied 28 cherries in bunches of 7 cherries each: how many bunches did I make?

4. How many sevens in 35? How many fives in 35?

5. If 7 pencils cost 42 cents, what will one cost?

6. At $7 each, how many calves can be bought for 49 dollars?

7. How many yards at 7 cents a yard can be bought for 56 cents?

8. 63 is seven times what number?

9. John spent 63 cents in one week: how much did he spend each day?

10. How many times $7 is $49?

11. Continue: $7 \div 7 = 1$. $14 \div 7 = 2$. $21 \div 7 = 3$.

(12.)	(13.)	(14.)	(15.)	(16.)	(17.)
$7)\underline{14}$	$7)\underline{21}$	$7)\underline{28}$	$7)\underline{35}$	$7)\underline{49}$	$7)\underline{70}$

LESSON VIII.

8 in	8,	1 time.	8 in	48,	6 times.
8 "	16,	2 times.	8 "	56,	7 "
8 "	24,	3 "	8 "	64,	8 "
8 "	32,	4 "	8 "	72,	9 "
8 "	40,	5 "	8 "	80,	10 "

1. At 8 cents a quart, how many quarts of milk can be bought for 16 cents?

2. If one slate cost 8 cents, how many can be bought for 24 cents?

3. 8 boys earned 32 cents: what was each boy's share?

4. I paid 40 cents for 8 bouquets: what was the price of one?

5. 8 quarts make a peck: how many pecks in 48 quarts of corn?

6. 8 pounds of oatmeal cost 56 cents: what was the price of one pound?

7. How many pews, each seating 8 children, will seat 64 boys?

8. How many eights in 72? In 80? In 88? In 96? In 800?

9. How many yards of velvet at $8 a yard can be bought for $72?

10. How many times $8 is $40?

11. Continue: $8 \div 8 = 1$. $16 \div 8 = 2$. $24 \div 8 = 3$.

(12.)	(13.)	(14.)	(15.)	(16.)	(17.)
$8)\underline{16}$	$8)\underline{24}$	$8)\underline{32}$	$8)\underline{80}$	$8)\underline{56}$	$8)\underline{72}$

LESSON IX.

9	in	9,	1	time.	10	in	10,	1	time.
9	"	18,	2	times.	10	"	20,	2	times.
9	"	27,	3	"	10	"	30,	3	"
9	"	36,	4	"	10	"	40,	4	"
9	"	45,	5	"	10	"	50,	5	"
9	"	54,	6	"	10	"	60,	6	"
9	"	63,	7	"	10	"	70,	7	"
9	"	72,	8	"	10	"	80,	8	"
9	"	81,	9	"	10	"	90,	9	"
9	"	90,	10	"	10	"	100,	10	"

LESSON X.

11	in	11,	1	time.	12	in	12,	1	time.
11	"	22,	2	times.	12	"	24,	2	times.
11	"	33,	3	"	12	"	36,	3	"
11	"	44,	4	"	12	"	48,	4	"
11	"	55,	5	"	12	"	60,	5	"
11	"	66,	6	"	12	"	72,	6	"
11	"	77,	7	"	12	"	84,	7	"
11	"	88,	8	"	12	"	96,	8	"
11	"	99,	9	"	12	"	108,	9	"
11	"	110,	10	"	12	"	120,	10	"
11	"	121,	11	"	12	"	132,	11	"
11	"	132,	12	"	12	"	144,	12	"

LESSON XI.

When the divisor consists of one figure.

How many chairs, at $2 each, can be bought for $246?

Analysis.—1. Write the divisor to the left of the dividend, with a curve line between them, and begin at the left to divide.

Slate work.

2)246

Chairs 123 *Ans.*

2. 2 is contained in 2 hundreds 1 hundred times; write the 1 under the figure divided, for it is of the **same order.**

3. 2 is contained in 4 tens, 2 tens times; write the 2 under the figure divided, for it is of the **same order.**

4. Continue thus until each figure is divided.

Hence the quotient is 123.

To divide by one figure when the divisor is not contained an even number of times.

Slate work.

Analysis.—1. Write the divisor to the left of the dividend, with a curve line between them.

4)3369

842¼

2. 4 is not contained in 3 thousands any thousands times; unite the 3 thousands and 3 hundreds, making 33 hundreds. 4 is contained in 33 hundreds, 8 hundred times, and a remainder; write the 8 under the figure divided.

3. 1 hundred and 6 tens make 16 tens. 4 is contained in 16 tens, 4 tens times; write the 4 under the figure divided.

4. 4 is contained in 9 units, 2 times; write the 2 under the figure divided. 9 is the last figure; write the last remainder over the division, and annex it to the quotient.

Hence the quotient is 842¼.

LESSON XII.

When the divisor exceeds 12.

Divide 48352 by 32.

1. 32 is contained in 48 thousands, 1 thousand time. Write the 1 thousand in the quotient; multiply the divisor by it; subtract the product from the figures divided, and annex to the remainder the next figure of the dividend for **a partial dividend.**

2. 32 is contained in 163 hundreds, 5 hundreds times. Write the 5 hundreds in the quotient, and continue the above process until all the figures of the dividend have been brought down.

Hence the quotient is 1511.

```
32)48352(1511
   32
   —
  163
  160
  ---
   35
   32
   --
    32
    32
    --
```

RULE FOR DIVISION.

1. *Write the divisor to the left of the dividend, and draw a curve line for the quotient.*

2. *Find how many times the divisor is contained in the least number of left-hand figures that will contain it, and write the result in the quotient.*

3. *Multiply the divisor by the quotient figure; subtract the product from the figures divided, and to the remainder annex the next figure of the dividend for a partial dividend.*

4. *Divide as before, until all the figures of the dividend have been brought down.*

5. *If any partial dividend will not contain the divisor, write a cipher in the quotient, annex the next figure of the dividend to the partial divisor, and divide as before.*

6. *If there be a final remainder, write it over the divisor, and annex it to the quotient.*

Proof.—Multiply the quotient by the divisor.

UNITED STATES MONEY.

A coin is a piece of metal bearing a legal stamp. Each coin has a fixed value.

Paper money consists of notes and bills issued by a government or a bank, as substitutes for coin. **Notes and bills** are promises to pay stated sums of money.

United States Money is the legal currency of the United States.

The denominations are eagles, **dollars**, dimes, cents, and mills.

The Unit of United States money is the **Dollar.**

TABLE.

10 mills (m.)	make	1 cent,	ct.
10 cents	"	1 dime,	d.
10 dimes	"	1 dollar,	$.
10 dollars	"	1 eagle,	E.

The coin of the United States consists of *gold*, *silver*, *nickel*, and *bronze*.

The gold coins are the double-eagle, eagle, half-eagle, quarter-eagle, three dollars, and one-dollar pieces.

The silver coins are the trade dollar, half-dollar, quarter-dollar, and dime.

The nickel coins are the five-cent and three-cent pieces.

The bronze coins are the two-cent and one-cent pieces.

ENGLISH MONEY.

English Sterling Money is the legal currency of Great Britain.

The denominations are **pounds**, shillings, pence, and farthings.

The **Unit** of English money is the pound sterling or **Sovereign**.

TABLE.

4 farthings (far.)	make	1 penny,	d.
12 pence	"	1 shilling,	s.
20 shillings	"	1 pound,	£,
		1 sovereign,	sov.
2 shillings = 1 florin.		1 pound = $4.866⅔.	
5 " 1 crown.		1 shilling = 24 cents	
21 " 1 guinea.		1 penny = 2 cents.	

FRENCH MONEY.

French Money is the legal currency of France.

The denominations used in business are napoleons, **francs**, and centimes.

The Unit of French money is the **Franc**.

The value of the franc is 18 cents and 6 mills.

TROY WEIGHT.

The Standard Unit of weight in the United States is the **Troy pound.**

Troy Weight is used in weighing gold, silver, coin, jewels, etc.

The denominations are **pounds**, ounces, pennyweights, and grains.

TABLE.

24 grains (gr.)	make	1 pennyweight,	pwt.
20 pennyweights	"	1 ounce,	oz.
12 ounces	"	1 pound,	lb.
$3\frac{1}{5}$ grains	"	1 carat.	
5760 grains	"	1 pound.	

1 grain. 24 grains. 480 grains. 5760 grains.

APOTHECARY WEIGHT.

Apothecary Weight is used in preparing medicine, but all drugs are bought and sold in large quantities by Avoirdupois Weight.

The denominations are pounds, ounces, drams, scruples, and grains.

TABLE.

20 grains (gr.)	make	1 scruple,	℈.
3 scruples	"	1 dram,	ʒ.
8 drams	"	1 ounce,	℥.
12 ounces	"	1 pound.	lb.
5760 grains	"	1 pound.	

The pound, ounce, and grain of this weight are the same as those of Troy weight, the difference being in the subdivision of the ounce.

1 gr. 20 gr. 60 gr. 480 gr. 5760 gr.

AVOIRDUPOIS WEIGHT.

Avoirdupois Weight is used to weigh all coarse and heavy articles.

The denominations are tons, hundredweights, quarters, **pounds**, and ounces.

The Long ton is used in the United States Custom-houses and in selling coal at the mines.

TABLE.

16 ounces (oz.)	make	1 pound,	lb.
25 pounds	"	1 quarter,	qr.
4 quarters	"	1 hundredweight,	cwt.
20 hundredweight	"	1 ton,	T.
2240 pounds	"	1 Long ton,	L. T.
7000 Troy grains	"	1 avoirdupois pound.	

Not used.

437½ gr.

7000 gr.

LIQUID OR WINE MEASURE.

Liquid Measure is used in measuring wine, liquor, milk, water, etc.

The denominations are hogsheads, barrels, **gallons**, quarts, pints, and gills.

TABLE.

4 gills (gi.)	make	1 pint,	pt.
2 pints	"	1 quart,	qt.
4 quarts	"	1 gallon,	gal.
231 cubic inches	"	1 gallon.	
31½ gallons	"	1 barrel,	bbl.
2 barrels	"	1 hogshead,	hhd.

Barrels and hogsheads are not fixed measures.

DRY MEASURE.

Dry Measure is used in measuring grain, fruit, salt, etc.

The denominations are **bushels**, pecks, quarts, and pints.

TABLE.

2 pints (pt.)	make	1 quart,	qt.
8 quarts	"	1 peck,	pk.
4 pecks	"	1 bushel,	bu.
36 bushels	"	1 chaldron,	ch.
2 quarts	"	1 small measure.	

The standard bushel contains 2150.42 cubic inches. It is a cylindrical measure, 18½ inches in diameter and 8 inches deep.

LONG MEASURE.

Long Measure is used in measuring lines and distances.

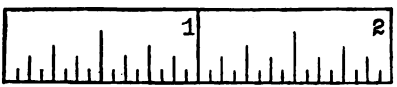
The denominations are leagues, **miles**, furlongs, rods, yards, feet, and inches.

TABLE.

12	inches (in.)	make	1 foot,	ft.
3	feet	"	1 yard,	yd.
16½	feet	"	1 rod,	rd.
5½	yards	"	1 rod.	
40	rods	"	1 furlong,	fur.
8	furlongs	"	1 mile,	mi.
5280	feet	"	1 mile.	
3	miles	"	1 league.	

OTHER DENOMINATIONS.

4	inches	make	1 hand,	h.
6	feet	"	1 fathom,	fath.
1⅛	miles	"	1 knot,	k.



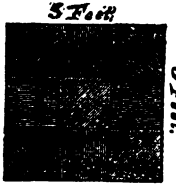
Cloth Measure is no longer used. In measuring dry-goods, etc., the yard is divided into halves, quarters, eighths, etc.

SURVEYORS' LONG MEASURE.

Surveyors' Long Measure is used in laying out roads and measuring land.

The unit of measure is **Gunter's Chain.** It is 66 feet long, and consists of 100 links. 80 chains make one mile.

SURFACE, OR SQUARE MEASURE.



A surface has two dimensions —**length and breadth.**

A square is a plane figure having four equal sides and four right angles.

Surface, or Square Measure is used in measuring **the surface** of land, boards, plastering, etc.

The denominations are square **miles, acres,** square rods, square yards, square feet, and square inches.

TABLE.

144	square inches (sq.in.)	make 1	square foot,	sq.ft.
9	square feet	make 1	square yard,	sq. yd.
30¼	square yards	" 1	square rod,	sq. rd.
272¼	square feet	" 1	square rod.	
160	square rods	" 1	square acre,	A.
640	acres	" 1	square mile,	sq. mi.

SURVEYORS' SQUARE MEASURE.

Surveyors' Square Measure is used by surveyors in computing the area or surface of lands.

TABLE.

16 square rods make 1 square chain, sq. ch.
10 square chains " 1 acre, A.
640 acres make 1 square mile or section.
36 square miles make 1 township.

Government lands are divided into townships by parallels and meridians.

CUBIC, OR SOLID MEASURE.

A Solid has three dimensions—**length, breadth,** and **thickness.**

A Cube is a body bounded by six equal squares, called **faces.**

The Volume, or contents of a solid is the space included within the surfaces which bound it.

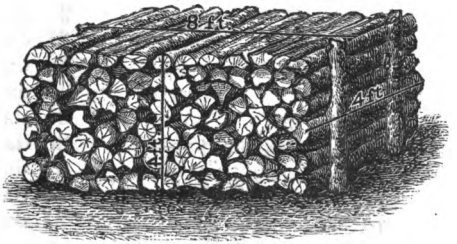
Cubic or Solid Measure is used in computing the volume of solids, and the capacity of rooms, cisterns, ships, etc.

The denominations are cubic yards, **cubic feet,** and cubic inches.

TABLE.

1728 cubic inches (cu. in.) make 1 cubic foot, cu. ft.
27 cubic feet " 1 cubic yard, cu. yd.
128 cubic feet " 1 cord of wood.

A Cord of Wood is a pile 8 feet long, 4 ft. wide, and 4 ft. high.



TIME MEASURE.

The denominations of Time Measure are **years**, months, days, hours, minutes, and seconds.

TABLE.

60 seconds (sec.)	make	1 minute,	min.
60 minutes	"	1 hour,	hr.
24 hours	"	1 day,	d.
7 days	"	1 week,	w.
30 or 31 days	"	1 month,	mo.
12 months	"	1 year,	y.
52 weeks	"	1 year.	
365 days	"	1 common year.	
366 days	"	1 leap year.	
100 years	"	1 century.	

The exact length of a solar year is 365 days, 5 hrs., 48 min., 46 sec., or nearly $365\frac{1}{4}$ days.

NAMES OF THE MONTHS.

1. January	(Jan.)	has	**31** days.
2. February	(Feb.)	"	**28** days.
3. March	(Mar.)	"	**31** days.
4. April	(Apr.)	"	**30** days.
5. May	(May)	"	**31** days.
6. June	(June)	"	**30** days.
7. July	(July)	"	**31** days.
8. August	(Aug.)	"	**31** days.
9. September	(Sept.)	"	**30** days.
10. October	(Oct.)	"	**31** days.
11. November	(Nov.)	"	**30** days.
12. December	(Dec.)	"	**31** days.

Thirty days hath September,
April, June, and November;
All the rest have thirty-one, except February.

CIRCULAR, OR ANGULAR MEASURE.

A Circle is a plane figure bounded by **a curve line**, every point of which is equally distant from a point within, called the **centre.**

A Circumference is the curve line which bounds the circle.

The circumference is $3\frac{1}{7}$ times the diameter.

An Arc is any part of the circumference.

A Radius is any straight line drawn **from the centre** to the circumference.

A Diameter is a straight line drawn **through the centre,** and terminated both ways by the circumference.

An Angle is the difference in the direction of two lines drawn from the same point, called **the Vortex.**

Circular, or Angular Measure is used in measuring angles and arcs of circles. It is used in astronomy, geography, navigation, surveying, and for calculating difference of time.

TABLE.

60	seconds (″)	make	1 minute,	′
60	minutes	"	1 degree,	°
90	degrees	"	1 quadrant,	quad.
360	degrees	"	1 circle.	
$69\frac{1}{3}$	miles	"	1 degree of latitude.	

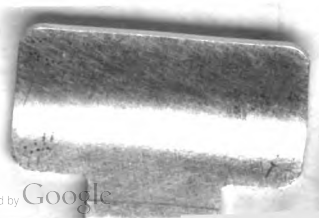
MISCELLANEOUS TABLES.

COUNTING.

12 units	make	1 dozen.
12 dozen	"	1 gross.
12 gross	"	1 great gross.
20 units	"	1 score.

PAPER.

24 sheets	make 1 quire.	2 reams	make 1 bundle.
20 quires	" 1 ream.	5 bundles	" 1 bale.



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